

The speakers were introduced by Alfreda Galt, President of the Lifwyn Foundation. She also paid tribute to Margaret Rioch, the woman in whose honour these talks were given, and whose seminal writings and leadership were so vital to the advancement of the Tavistock model in the United States. The intergroup encounter is a generic phenomenon which is a field of study for the A.K. Rice Institute; the Saturday meeting gave an opportunity for observation of both inter-organizational and intra-organizational conflict. The following are papers presented at the meeting.

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Evolution of Attentional Processes in the Human Organism

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In this article I explore the evolution of human attention, focusing particularly on the phylogenetic and ontogenetic implications of the work of the American psychoanalyst Trigram Burrow. Attentional development is linked to the emergence of visual perspective, and this, in turn, is related to Burrow's notion of 'ditenion' (divided or paritive attention). Burrow's distinction between 'ditenion' and 'cotention' (total organismic awareness) is examined, and expanding on this, I identify a threefold pattern of perceptual change: protention→ditenion→cotention. Next, I relate ditensive visual perspective to binocular convergence, and make use of the 'perspectively ambiguous', 'non-convergent' Gestalt figure known as the Necker Cube to illustrate cotention. In conclusion, I propose, with Burrow, that the shift from the currently pervasive ditensive pattern of awareness to a cotentive mode could have a salutary effect on human society.

Key words: attentional processes, cotention, differentiation, ditention, human attention

For almost a hundred years, there has been a growing tendency to challenge the mechanistic conception of the world that had prevailed since the time of the Renaissance. In modern physical science (Einsteinian relativity and quantum mechanics), the old Newtonian idea of isolated bodies interacting through forces that are strictly external, has been superseded by a notion of intimately interwoven processes. According to the philosopher of science Milic Capek (1961), this transition to process – to the view that, at

bottom, nature involves dynamic, internal, holistic relations – is what 20th-century physics is all about.

This is especially evident in the work of the renowned theoretical physicist David Bohm, who had participated in the activities of the Lifwynn Foundation until his recent death. Bohm observed that in the post-Renaissance mechanistic order:

... the world [...] was regarded as constituted of entities which are outside of each other in the sense that they exist independently in different regions of space (and time) and interact through forces that do not bring about any changes in their essential natures. (1980: 173)

The contrasting *modern* order, epitomized in contemporary physics, functions more like an *organism* than a machine, like an entity in which 'jedes part grows in the context of the whole, so that it does not exist independently, nor can it be said that it merely "interacts" with others, without itself being essentially affected in this relationship' (1980: 173). According to Bohm, *Einsteintian space-time structures* possess this organic quality, inasmuch as they cannot be understood as isolated, rigidly bounded bodies, but must be grasped as locally intense concentrations of an overall field. The non-mechanistic, processual quality is even more apparent in the domain of quantum mechanics, where we find such phenomena as the *indivisibility of motion* (an electron can go from one state to another without passing through any states in between), *non-local connectedness* (particles separated by vast space-time intervals may nevertheless behave as if linked in an immediate and intimate way), and the inseparability of the observer and observed. So Bohm was telling us that, with the guidance of modern physics, we are able to see that nature is grounded in 'an order that is radically different from that of Galileo and Newton – the order of *undivided wholeness*' (1980: 125).

Now, the evolution of *life* from this holistic physical substrate is widely recognized as entailing a process of *differentiation*. To cite just one specific example, the theoretical biologist Howard Pattee (1973) maintains that life emerges when a *description* of nature separates out from nature itself. And we can say that life evolves to states of *greater* complexity by a movement from relatively undifferentiated conditions to those with *greater* and *greater* numbers of distinctions. Theorists Hermann Weyl (1952) and Arthur Young (1976) independently portrayed this as a loss of symmetry, and in the view of psychologist Heinz Werner (1948),

this tendency toward differentiation plays the pivotal role both in phylogeny and ontogeny.

We may understand the development of *human* life as a furtherance of the process of differentiation. The complexity of human experience reflects the intricate interplay of physical, sensory, affective and cognitive processes. Phylogenetically speaking, the latter, cognitive sphere is the most recent to appear, and is related to the development of the cerebral cortex of the brain. There is general agreement that the articulation of the cortex was accompanied by the advent of symbolic language, this aspect of human functioning having the *greatest* potential for differentiation (for multi-faceted reflective activity, the drawing of finer and finer distinctions, and so forth).

In the work of Trigant Burrow, the elaboration of the human brain and concomitant emergence of symbolic language is understood in terms of changes in *attentional* processes. Let us assume, with Burrow, that phylogeny is mirrored in ontogeny (see, for example, Burrow, 1928: 6). Then we may say that, initially, in the infantile state prior to actualizing the human potential for symbolic operations, attention is, for the most part, undivided, the new organism being in essential harmony with its environment, with its 'maternal source' or 'phylogenetic matrix', as Burrow called it (1926: 349). Here, having not yet entered into the process of differentiation/individuation, the organism participates in the natural interrelatedness associated with simpler structures, and, ultimately, with the underlying interwovenness of physical processes. This does not necessarily mean that the experience of the infant is *utterly* undifferentiated. Recent research findings indeed suggest that infantile experience is not as undifferentiated as previously thought (Lichtenberg, 1983; Stern, 1985). On the other hand, the developmental theorist Michael Washburn (1994) has argued that, even if infantile awareness is not totally undifferentiated, it is at least *relatively* undifferentiated (i.e. undifferentiated relative to the forms of awareness arising in later stages of growth). I would add that differentiation may occur very rapidly and at a very early stage of ontogeny. If we allow for this possibility, we should be cautious about extrapolating the results of empirical research with infants to earlier periods, lest we overestimate the level of differentiation prevailing at those earlier times.

The relatively diffuse, undivided attentional pattern of early infancy may be better understood by comparing it with more mature

forms of attention. The development of focused attention essentially depends on establishing a *perspective*, a point of view, which implies the separation of the viewer or subject from what is viewed, what is cast before it, what is object (from the Latin, *obijcere*, 'to cast before'). The neonate is primarily 'unperspectival' (to use the term of consciousness researcher Jean Gebser [1985]); it has not yet developed a well-defined point of view. Because there is little separation of viewer from viewed, the new organism cannot view anything in a sharply focused way. In this largely undifferentiated mode of awareness (perceived objects are not clearly set off from each other, figure is not sharply distinguished from ground), the organism evidently is not yet fully *attending* to its environment, not yet 'stretching out' toward it from a well-established perspective of its own (the Latin *tendere* is 'to stretch out'); it would seem more appropriate to say that in this initial situation, the organism is *resting within* its environment (rather than attending to it). I suggest that this nascent pattern of attention may be termed *protention*.

In the course of human ontogeny (reflected in phylogeny as well), embryonically differentiated, 'protentive' awareness gives way to what Burrow (1953) called *attention*. Here, accompanied by the development of symbolic language, there is the gradual emergence of perspective, an individualized point of view, an 'I'-persona' (Burrow, 1950: 469). It seems to me that this growth process is necessary for the realization of our human potential to individuate, (Burrow, 1949: 192) is overshadowed, the spurious impression being created that *separation alone* is the fundamental state of affairs. In this way, initial, protentive awareness becomes fragmented, with the center of human experience, its primary point of reference, becoming 'my' point of view. All defensive behavioral patterns (protecting 'my' position, striving to be 'right', asserting 'my' authority, etc.) stem from this ditentive posture in which the subject views the objects lying before him or her from his or her 'own' detached perspective. With Burrow, we suggest that this basic division of attention is largely responsible for the pervasive conflict evidenced in the contemporary world.

Burrow proposed that, to deal with the multitude of crises rooted in the 'social neurosis' that plagues us today, we need to supersede our ditentive habit pattern and adopt a different attentional posture, that of *cotention*. In the protentive condition, there is indeed what Burrow referred to as the 'solidarity of the species', but also an

absence of conscious awareness, a weakly differentiated, unreflective state of oblivion. With passage to the ditentive stance, reflectiveness is gained, yet at the expense of solidarity. The ditentive point of view rises out of, is projected from, our protentive species interrelatedness in such a way that both the interrelatedness and the projection process itself are *concealed*. This concealment is critical to maintaining the outlook of the 'I'-persona. We could not uphold the viewpoint of the 'individual' without blinding ourselves to the act whereby this 'I-centric' perspective emerges from the unperspectival (Gebser, 1985) background of organic wholeness. In the practice of *cotention*, this blindness would be dispelled.

The move to cotention is not simply a passage *from* the ditentive splitting of 'I' and 'thou' to the undifferentiated protentive ground, a backward move wherein the 'I-thou' or subject-object distinction simply would vanish. Here we do not merely *undo* the unreflective infantile pattern as originally lived. Rather, abstract projection of reflective, cognitive consciousness and restore the unreflective infantile pattern as originally lived. Rather, abstract cognition is retained, along with its differentiative, distinction-making tensional pattern. And yet, *simultaneously*, we become concretely cognizant of how this pattern arises from the protentive state of affairs. So the projection of differentiating consciousness is *withdrawn or retracted*, which is not to say erased. Alfreda Galt's (1991) account of Burrow's group work is interesting in this regard.

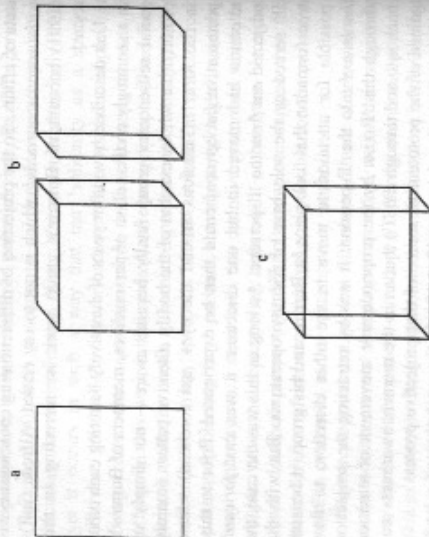
Galt described how, after years of ditentively battering each other in a seemingly endless clash of personalities, members of Burrow's social self-enquiry group finally became aware — not simply of protentive wholeness, but of the bodily ditentive pattern (mainly in the form of tensions around the eyes and forehead) whose protentive *background* could then be experienced. Prior to this, attention had moved in but one direction: it was cast *forward*, projected *out from* the 'I'-persona. As long as this was the case, the 'I' served as the sole base of identity operations. But with the transformation that took place in Burrow and his group, it became possible for attention to move in the other direction, to flow *backward into* the 'I'-persona. It was by retracting the projection through this 'I' (i.e. by the proprioceptive movement of attention back into and through the 'I') that an in-the-moment awareness was gained of the protentive source of that projective process.

Implied in what I have said so far is the operation of a basic

developmental pattern, a transformation of human attention reflected both in ontogeny and phylogeny: the passage from protention to attention to cotention. In our previous work, Lloyd Gilden and I have independently articulated such a concept of orthogenetic change (see Gilden, 1992 and Rosen, 1994). I will now attempt to describe the process in a more graphic way. My ultimate aim is not just to explicate the transition to cotention, but to *expedite* it.

In Figure 1, the three stages of attentional development are depicted. The protentive stage is portrayed by a flat, featureless plane (Figure 1a), symbolizing the undifferentiated state of affairs that prevailed before the emergence of perspective. In the second stage, distinct perspectives arise (Figure 1b), an event we have associated with the appearance of attention. The final stage of attentional development is represented by Figure 1c, a structure known in phenomenology and Gestalt psychology as the Necker cube.

FIGURE 1
Stages of attentional development: protentive pre-perspectival (a), attentional pre-perspectival (b) and cotentive/co-perspectival (c).



The Necker cube merges the separate perspectives of Figure 1b, incorporating them in a single spatial configuration. Yet, in our customary way of viewing the cube, we perceive only one of these perspectives at a time; therefore, with respect to *time*, the cube remains perspectively polarized. Nevertheless, it is possible to view the cube in a thoroughly integrated fashion. Rather than allowing our experience of the figure to oscillate from one perspective to the other, we may apprehend both perspectives at once. If this is done without allowing the cube simply to flatten into an array of connected lines, that is, if the awareness of depth is retained, we should experience a sense of self-penetration: the form will appear to go *through* itself. Such a mode of imaging has a revealing effect on the perception of the cube's faces.

In the conventional, perspectively polarized ('directive') way of viewing the figure, when the transition is made from one pole to the other, the three faces of the cube that were seen to lie 'inside' presently appear on the 'outside' and vice versa. But it is only at 'polar extremes' that faces are perceived as *either* inside *or* outside. With perspectival fusion, each face presents itself as being inside and outside at the same time, thereby producing an experience of one-sidedness, one in which all six faces — all the bounding surfaces that enclose the three-dimensional object being symbolized — are simultaneously given. I want to emphasize that this self-intersecting experiential structure does not merely *negate* the perspectival distinction between sides, reproducing original, pre-perspectival, uniform flatness. In the *co*-perspectival mode, faces *are* inside, yet they are *outside* as well. The structure is as fully two-sided as it is one-sided.

I suggest that the perspectival integration of the Necker cube, itself entailing an experiential exercise, might indicate the basis for a natural bridge between the theoretical exposition of cotention, and the actual cotentive practice (note, by the way, that Lloyd Gilden, in his own presentation, will shed further light on the relationship between cotention and what we call 'social self-enquiry' — the 'group' work of the Lifwynn Foundation). Normal binocular vision operates in such a way that our eyes function in concert to bring a particular object into focus; this figure standing out from its background. In viewing the Necker cube, our strong inclination to see *either* one perspective *or* the other derives from the well-established neurophysiological habit of binocular convergence (there is reason to believe that, historically, this habit was reinforced

around the time of the Renaissance, and was associated with the enhancement of depth perception, the increased use of perspective in art, advances in map-making, in mathematics and science, and so on). It seems that binocular convergence is a process of diantine objectification (object- or figure-making) that is intimately associated with the symbolic operations of the cerebral cortex. I believe Burrow came close to explicitly stating this conclusion when he related the advent of ditation to the elaboration of linguistic activity and language (symbolic behavior) to the movement of the musculature in and around the eyes (Burrow, 1953). What I propose we may add to Burrow's formulation by way of further specifying it, is that the oculofacial movements in question entail the shifting of optical focus from this object to that, in continual acts of binocular convergence. If this is the case, if ditation is fundamentally linked to the act of binocular convergence, what does it tell us about *cotention*?

In the exercise of perspectival integration with the Necker cube, binocular convergence is superseded in a certain limited way. We may think of normal attention to (binocular convergence upon) a given perspective of the cube (in exclusion of its opposite) as arising from the preconscious, protentive field in which the two perspectives are not yet well differentiated. In other words, the cube may be regarded as preconsciously given in the form of an undifferentiated whole, with each and every act of consciously perceiving it being a momentary act of differentiation (such an interpretation is supported by Heinz Werner's [1948] notion of 'microgeny'). In the practice of viewing *both* of the perspectives of the cube at once without losing the perception of depth, in effect, we are experiencing the pre-perspectival totality of the cube (protention) without simply erasing the perspectival division of spectives simultaneously) would seem to constitute an instance of *cotention* – not an undifferentiated unity that merely would nullify binocular convergence (it is convergence that creates the experience of depth), nor the simple division of attention that operates when perception is *controlled* by binocular convergence.

However, there is clearly a limitation in the exercise with the Necker cube. It is obvious that binocular convergence upon a perspective of the cube is not the same as binocular convergence upon a solid object in three-dimensional space, since the cube gives but a one-dimensional (line drawn) schematization of a solid object.

I submit that this is the reason we do not experience the exercise with the cube as fully *proprioceptive*. The perspectival integration of the cube is itself given in perspective; it appears to the viewer as an 'objective event' occurring out in space, one cast *before* the viewer's eyes, not one that proprioceptively incorporates the viewing eye itself. Evidently, for perspectival integration to encompass the subject's own perspective and not be limited to an object appearing in front of her or him, we would require a structure that is like the Necker cube but of a *higher dimensionality*. I am proposing, in other words, that, while one does not 'lose one's objectivity' in perspectival integration of the Necker cube, while the integrated viewing of this one-dimensional object does not seem to encompass our subjective viewing process – the perspectival integration of the solid, *three-dimensional* objects we encounter 'out in space' would be different. Here integration could be achieved only through a higher-order structure or process that, in retracting the projections of the 'objects out there', would bring them back to a source that no longer could be denied as lying within *us*, within the subjectivity of the observer.

To be sure, such a withdrawal of projection would involve more than the psychodynamic projections of individual persons. The projections to be retracted would be those of the 'I-persona', an entity not to be confused with the ego of the isolated individual. In fact, Burrow understood the 'I'-persona to be the generic, *species-wide* entity or 'subject' that *lies behind* the appearance of individual subjectivity (Burrow, 1950: 469). It is the proprioception of this 'I'-persona that would constitute *cotention*. Said proprioception would bring a concrete awareness of the process by which we, as a species, create the impression of ourselves as isolated subjects before whom objects are projected. I am suggesting that this impression is created through linguistic/symbolic activity, and its perceptual concomitant, the act of binocular convergence. These are the projective acts that would need to be retracted proprioceptively; they are the acts we are engaging in at this very moment. Finally, I am proposing that a structure similar to the one-dimensional Necker cube, yet possessing sufficient dimensionality to encompass the 'fourth-dimensional' human subject, would serve as the guiding conceptual accompaniment of the cotentive *experience* that is needed.

But I have to confess that, in introducing the question of dimensionality, I have strayed beyond the purview of my presentation – which I must shortly bring to an end! At this late stage, I can

only say that I have devoted a great deal of attention to the issue (see Rosen, 1994). I have worked with one-sided topological structures that, in essence, are higher-dimensional counterparts of the perspectively integrated Necker cube. In particular, I have developed intensive theoretical interpretations of the Moebius surface and the Klein bottle, the latter being a kind of 'protopreceptive', self-intersecting entity that indeed does require a fourth dimension for its completion. It has been especially important for me to demonstrate, in this regard, that the 'fourth dimension' is no objective space (as it is implied to be in traditional mathematics) but the dimension of human subjectivity.

Be that as it may, I must conclude my paper and will do so by going back to the beginning. At the outset, I spoke of our underlying interrelatedness, and proposed that this is not limited to the human species but enfolds all life, and indeed, all of nature, as implied by the findings of modern physics. This seems to suggest that a full-fledged shift to cotention might not only address the problem of *human* conflict, but also the problematic relationship between human beings and other species, and between humans and the physical environment as a whole, as reflected in the grave ecological crisis now confronting us. It is my conviction that, to address this impending catastrophe, it will take more than government legislation or the intention of changing our behavior (by recycling, practicing conservation and the like). I believe, with Burrow, that an underlying change in our pattern of attention will be required, one enabling us to apprehend in a direct and concrete fashion our intimate interwovenness with each other and with all that is.

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